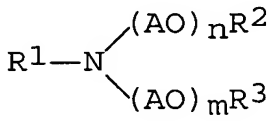
CLAIMS

1. A method for controlling fungi, bacteria, insects, mites and acarids, said method comprising applying an effective amount of an agricultural chemical composition thereto, said agricultural chemical composition comprising:

(a) an agricultural chemical;

(b) at least one nitrogen-containing compound selected from the group consisting of:

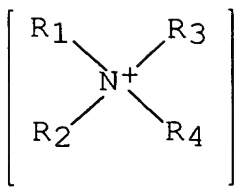
(i) amines represented by formula (1):



(1)

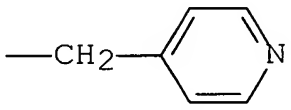
wherein R^1 represents a linear or branched alkyl or alkenyl group having 8 to 22 carbon atoms, each A represents an alkylene group, n and m each represents a number wherein the sum of n and m is 1 to 40, R^2 and R^3 are the same or different from each other and each represents a hydrogen atom or an acyl group;

(ii) quaternary ammonium salts represented by formula (13):



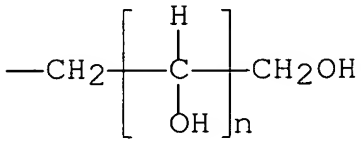
(13)

wherein at least one of R_1, R_2, and R_3 represents a linear or branched alkyl or alkenyl group having 8 to 30 carbon atoms while the other(s) each represents a methyl group, an ethyl group, a benzyl group, a group represented by the formula



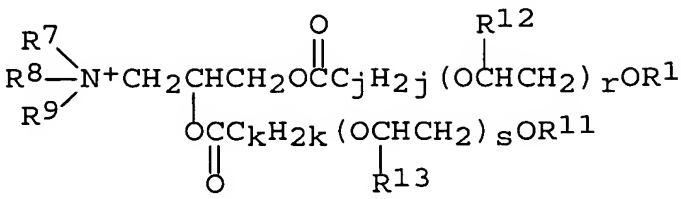
,

a group represented by the formula $-(CH_2CH_2O)_n-H$, wherein n represents an average value and is a number of 1 to 100, or a group represented by the formula



wherein n is a number of 1 to 5, R_4 represents a hydrogen atom, a methyl group, an ethyl group, or a group represented by the formula $-CH_2CH_2OH$, and X^- represents a counter ion;

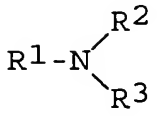
(iii) quaternary ammonium salts represented formula (8):



(8)

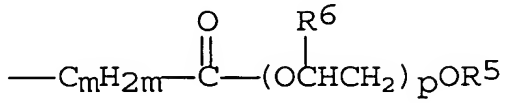
wherein R^7 and R^8 are either the same or different from each other and each represents an alkyl group having 1 to 4 carbon atoms, R^9 represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms, R^{10} and R^{11} are either the same or different from each other and each represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, each R^{12} represents a hydrogen atom or a methyl group, each R^{13} represents a hydrogen atom or a methyl group, j and k are either the same or different from each other and each represents a positive number of 1 to 5, r and s each represents an average value, are either the same or different from each other, and each represents a number of 0 to 30, and X^- represents a counter ion;

(iv) amines represented by formula (3):



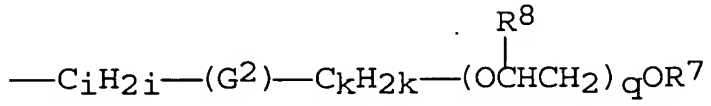
(3)

wherein R^1 represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, R^2 represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_nH_{2n}-(G^1)-R^4$, wherein R^4 represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, G^1 represents -OCO- or -NHCO-, and n represents a positive number of 2 to 6, a group represented by the formula



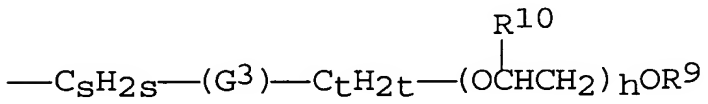
wherein R^5 represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group,

each R^6 represents a hydrogen atom or a methyl group, m is a positive number of 1 to 5, and p



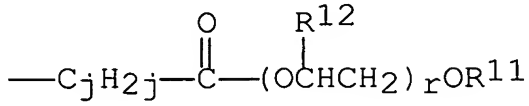
represents an average value and is a number of 0 to 30, or a group represented by the formula

wherein R^7 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^8 represents a hydrogen atom or a methyl group, G^2 represents -OCO- or -NHCO-, i represents a positive number of 2 to 6, k represents a positive number of 1 to 5, and q represents an average value and is a number of 0 to 30, and R^3 represents a group represented by the formula:



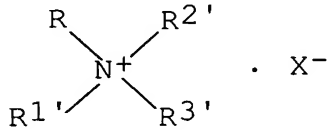
wherein R^9 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{10} represents a hydrogen atom or a methyl group, G^3 represents -OCO- or -NHCO-, s represents a positive number of 2 to 6, t represents a

positive number of 1 to 5, and h represents an average value and is a positive number of 0 to 30, or a group represented by the formula



wherein R^{11} represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{12} represents a hydrogen atom or a methyl group, j represents a positive number of 1 to 5, and r represents an average value and is a positive number of 0 to 30; and

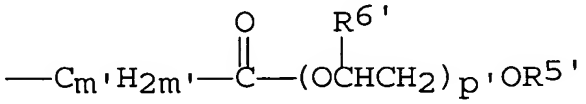
(v) quaternary ammonium salts represented by formula (9):



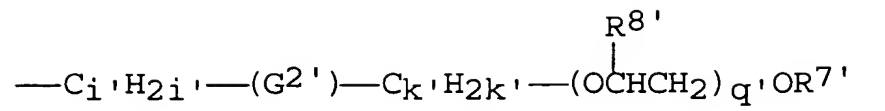
(9)

wherein R represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{1'}$ represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{2'}$ represents a linear or branched alkyl group having 1 to 36

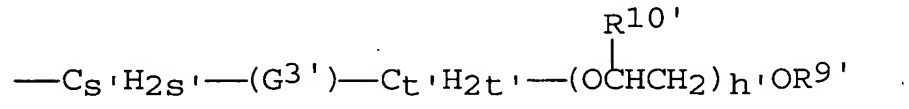
carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_{n'}-H_{2n'}-(G^{1'})-R^{4'}$, wherein $R^{4'}$ represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, $G^{1'}$ is -OCO- or -NHCO-, and n' is a positive number of 2 to 6, a group represented by the formula



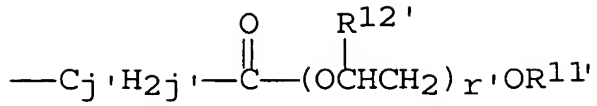
wherein $R^{5'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{6'}$ represents a hydrogen atom or a methyl group, m' is a positive number of 1 to 5, and p' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{7'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{8'}$ represents a hydrogen atom or a methyl group, $G^{2'}$ is -OCO- or -NHCO-, i' is a positive number of 2 to 6, k' is a positive number of 1 to 5, and q' represents an average value and is a number of 0 to 30, $R^{3'}$ represents a group represented by the formula:



wherein $R^{9'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{10'}$ represents a hydrogen atom or a methyl group, $G^{3'}$ is -OCO- or -NHCO-, s' is a positive number of 2 to 6, t' is a positive number of 1 to 5, and h' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{11'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{12'}$ represents a hydrogen atom or a methyl group, j' is a positive number of 1 to 5, and r' represents an average value and is a number of 0 to 30, and X^- is a counter ion; and

(c) a chelating agent selected from the group consisting of amino polycarboxylic acid chelating agents or salt thereof, aromatic carboxylic acid chelating agents or salt thereof, a salt of aliphatic carboxylic acid chelating agents, amino acid chelating agents or salt thereof, ether polycarboxylic acid chelating agents or salt thereof, phosphonic acid chelating agents or salt thereof, a salt of hydroxy carboxylic acid chelating agents, polymer or oligomer electrolyte chelating agents, dimethylglyoxime (DG), ascorbic acid or a salt thereof, and thioglycollic acid or a salt thereof; and

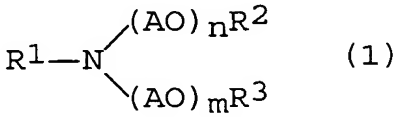
wherein the content of the chelating agent ranges from 0.01 to 30 mol per mol of the nitrogen-containing compound and the weight ratio of the total of the nitrogen-containing compound and the chelating agent to the agricultural chemical ranges from 0.05 to 50.

2. A method for regulating plant growth, said method comprising applying an effect amount of an agricultural chemical composition to a locus which would benefit from said treatment, said agricultural chemical composition comprising:

(a) an agricultural chemical;

(b) at least one nitrogen-containing compound selected from the group consisting of:

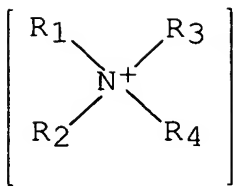
(i) amines represented by formula (1):



(1)

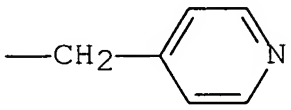
wherein R^1 represents a linear or branched alkyl or alkenyl group having 8 to 22 carbon atoms, each A represents an alkylene group, n and m each represents a number wherein the sum of n and m is 1 to 40, R^2 and R^3 are the same or different from each other and each represents a hydrogen atom or an acyl group;

(ii) quaternary ammonium salts represented by formula (13):



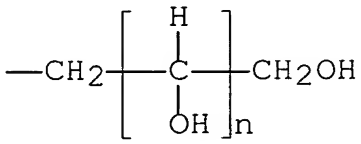
(13)

wherein at least one of R_1, R_2, and R_3 represents a linear or branched alkyl or alkenyl group having 8 to 30 carbon atoms while the other(s) each represents a methyl group, an ethyl group, a benzyl group, a group represented by the formula



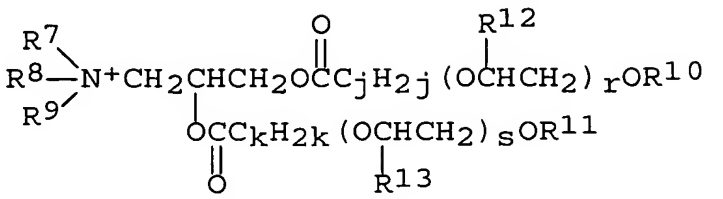
,

a group represented by the formula $-(CH_2CH_2O)_n-H$, wherein n represents an average value and is a number of 1 to 100, or a group represented by the formula



wherein n is a number of 1 to 5, R_4 represents a hydrogen atom, a methyl group, an ethyl group, or a group represented by the formula $-CH_2CH_2OH$, and X^- represents a counter ion;

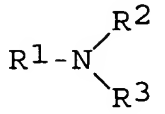
(iii) quaternary ammonium salts represented formula (8):



(8)

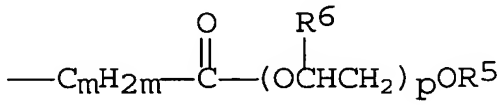
wherein R^7 and R^8 are either the same or different from each other and each represents an alkyl group having 1 to 4 carbon atoms, R^9 represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms, R^{10} and R^{11} are either the same or different from each other and each represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, each R^{12} represents a hydrogen atom or a methyl group, each R^{13} represents a hydrogen atom or a methyl group, j and k are either the same or different from each other and each represents a positive number of 1 to 5, r and s each represents an average value, are either the same or different from each other, and each represents a number of 0 to 30, and X^- represents a counter ion;

(iv) amines represented by formula (3):



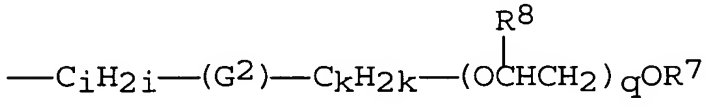
(3)

wherein R^1 represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, R^2 represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_nH_{2n}-(G^1)-R^4$, wherein R^4 represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, G^1 represents -OCO- or -NHCO-, and n represents a positive number of 2 to 6, a group represented by the formula

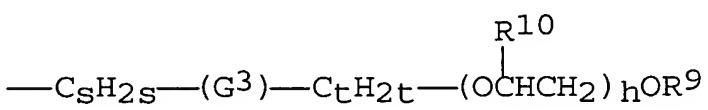


wherein R^5 represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group,

each R^6 represents a hydrogen atom or a methyl group, m is a positive number of 1 to 5, and p represents an average value and is a number of 0 to 30, or a group represented by the formula

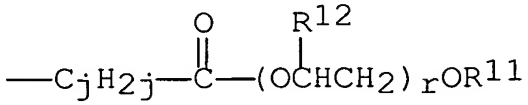


wherein R^7 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^8 represents a hydrogen atom or a methyl group, G^2 represents -OCO- or -NHCO-, i represents a positive number of 2 to 6, k represents a positive number of 1 to 5, and q represents an average value and is a number of 0 to 30, and R^3 represents a group represented by the formula:



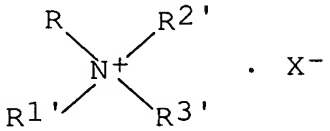
wherein R^9 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{10} represents a hydrogen atom or a methyl group, G^3 represents -OCO- or -NHCO-, s represents a

positive number of 2 to 6, t represents a positive number of 1 to 5, and h represents an average value and is a positive number of 0 to 30, or a group represented by the formula



wherein R^{11} represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{12} represents a hydrogen atom or a methyl group, j represents a positive number of 1 to 5, and r represents an average value and is a positive number of 0 to 30; and

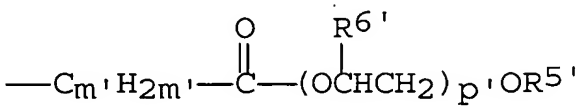
(v) quaternary ammonium salts represented by formula (9):



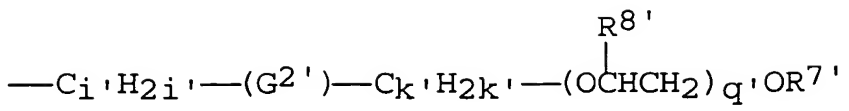
(9)

wherein R represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{1'}$ represents an alkyl group

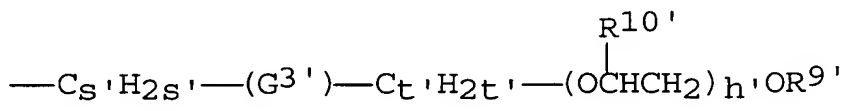
having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{2'}$ represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_{n'}-H_{2n'}-(G^{1'})-R^{4'}$, wherein $R^{4'}$ represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, $G^{1'}$ is -OCO- or -NHCO-, and n' is a positive number of 2 to 6, a group represented by the formula



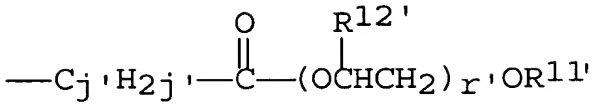
wherein $R^{5'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{6'}$ represents a hydrogen atom or a methyl group, m' is a positive number of 1 to 5, and p' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{7'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{8'}$ represents a hydrogen atom or a methyl group, $G^{2'}$ is -OCO- or -NHCO-, i' is a positive number of 2 to 6, k' is a positive number of 1 to 5, and q' represents an average value and is a number of 0 to 30, $R^{3'}$ represents a group represented by the formula:



wherein $R^{9'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{10'}$ represents a hydrogen atom or a methyl group, $G^{3'}$ is -OCO- or -NHCO-, s' is a positive number of 2 to 6, t' is a positive number of 1 to 5, and h' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{11'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{12'}$ represents a hydrogen atom or a methyl group, j' is a positive number of 1 to 5, and r' represents an average value and is a number of 0 to 30, and X^- is a counter ion; and

(c) a chelating agent selected from the group consisting of amino polycarboxylic acid chelating agents or salt thereof, aromatic carboxylic acid chelating agents or salt thereof, a salt of aliphatic carboxylic acid chelating agents, amino acid chelating agents or salt thereof, ether polycarboxylic acid chelating agents or salt thereof, phosphonic acid chelating agents or salt thereof, a salt of hydroxy carboxylic acid chelating agents, polymer or oligomer electrolyte chelating agents, dimethylglyoxime (DG), ascorbic acid or a salt thereof, and thioglycollic acid or a salt thereof; and

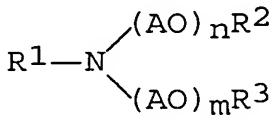
wherein the content of the chelating agent ranges from 0.01 to 30 mol per mol of the nitrogen-containing compound and the weight ratio of the total of the nitrogen-containing compound and the chelating agent to the agricultural chemical ranges from 0.05 to 50.

3. A method for enhancing the effectiveness of an agricultural chemical, wherein said method comprises applying an agricultural chemical composition with said agricultural chemical to a locus that would benefit from such treatment, said agricultural chemical composition comprising:

(a) the agricultural chemical;

(b) at least one nitrogen-containing compound selected from the group consisting of:

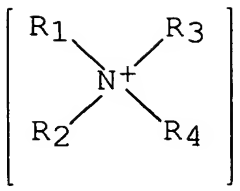
(i) amines represented by formula (1):



(1)

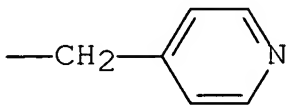
wherein R^1 represents a linear or branched alkyl or alkenyl group having 8 to 22 carbon atoms, each A represents an alkylene group, n and m each represents a number wherein the sum of n and m is 1 to 40, R^2 and R^3 are the same or different from each other and each represents a hydrogen atom or an acyl group;

(ii) quaternary ammonium salts represented by formula (13):



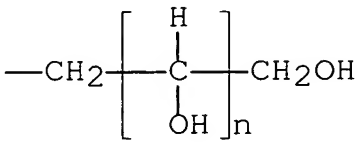
(13)

wherein at least one of R_1, R_2, and R_3 represents a linear or branched alkyl or alkenyl group having 8 to 30 carbon atoms while the other(s) each represents a methyl group, an ethyl group, a benzyl group, a group represented by the formula



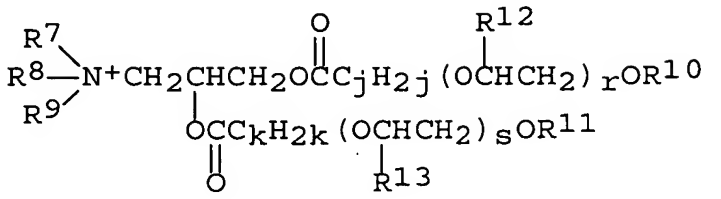
,

a group represented by the formula $-(CH_2CH_2O)_n-H$, wherein n represents an average value and is a number of 1 to 100, or a group represented by the formula



wherein n is a number of 1 to 5, R_4 represents a hydrogen atom, a methyl group, an ethyl group, or a group represented by the formula $-CH_2CH_2OH$, and X^- represents a counter ion;

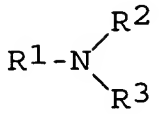
(iii) quaternary ammonium salts represented formula (8):



(8)

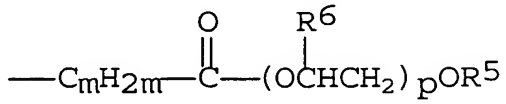
wherein R^7 and R^8 are either the same or different from each other and each represents an alkyl group having 1 to 4 carbon atoms, R^9 represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms, R^{10} and R^{11} are either the same or different from each other and each represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, each R^{12} represents a hydrogen atom or a methyl group, each R^{13} represents a hydrogen atom or a methyl group, j and k are either the same or different from each other and each represents a positive number of 1 to 5, r and s each represents an average value, are either the same or different from each other, and each represents a number of 0 to 30, and X^- represents a counter ion;

(iv) amines represented by formula (3):



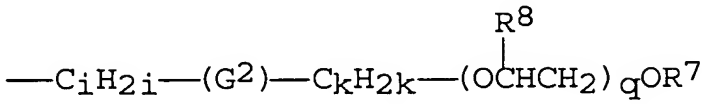
(3)

wherein R^1 represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, R^2 represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_nH_{2n}-(G^1)-R^4$, wherein R^4 represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, G^1 represents -OCO- or -NHCO-, and n represents a positive number of 2 to 6, a group represented by the formula

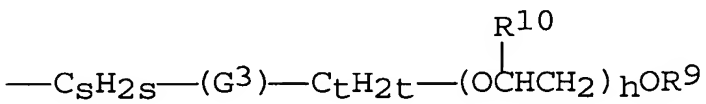


wherein R^5 represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group,

each R^6 represents a hydrogen atom or a methyl group, m is a positive number of 1 to 5, and p represents an average value and is a number of 0 to 30, or a group represented by the formula

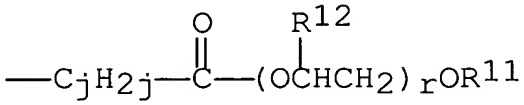


wherein R^7 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^8 represents a hydrogen atom or a methyl group, G^2 represents -OCO- or -NHCO-, i represents a positive number of 2 to 6, k represents a positive number of 1 to 5, and q represents an average value and is a number of 0 to 30, and R^3 represents a group represented by the formula:



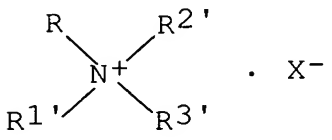
wherein R^9 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{10} represents a hydrogen atom or a methyl group, G^3 represents -OCO- or -NHCO-, s represents a

positive number of 2 to 6, t represents a positive number of 1 to 5, and h represents an average value and is a positive number of 0 to 30, or a group represented by the formula



wherein R^{11} represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{12} represents a hydrogen atom or a methyl group, j represents a positive number of 1 to 5, and r represents an average value and is a positive number of 0 to 30; and

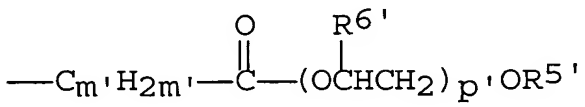
(v) quaternary ammonium salts represented by formula (9):



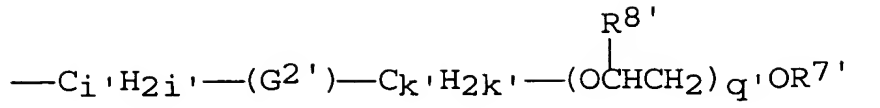
(9)

wherein R represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{1'}$ represents an alkyl group having 1 to 4 carbon atoms optionally

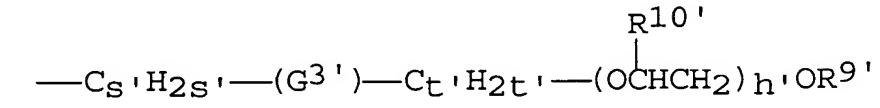
substituted by a hydroxyl group, $R^{2'}$ represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_{n'}-H_{2n'}-(G^{1'})-R^{4'}$, wherein $R^{4'}$ represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, $G^{1'}$ is -OCO- or -NHCO-, and n' is a positive number of 2 to 6, a group represented by the formula



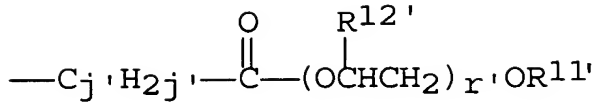
wherein $R^{5'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{6'}$ represents a hydrogen atom or a methyl group, m' is a positive number of 1 to 5, and p' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{7'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{8'}$ represents a hydrogen atom or a methyl group, $G^{2'}$ is -OCO- or -NHCO-, i' is a positive number of 2 to 6, k' is a positive number of 1 to 5, and q' represents an average value and is a number of 0 to 30, $R^{3'}$ represents a group represented by the formula:



wherein $R^{9'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{10'}$ represents a hydrogen atom or a methyl group, $G^{3'}$ is -OCO- or -NHCO-, s' is a positive number of 2 to 6, t' is a positive number of 1 to 5, and h' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{11'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{12'}$ represents a hydrogen atom or a methyl group, j' is a positive number of 1 to 5, and r' represents an average value and is a number of 0 to 30, and X^- is a counter ion; and

(c) a chelating agent selected from the group consisting of amino polycarboxylic acid chelating agents or salt thereof, aromatic carboxylic acid chelating agents or salt thereof, a salt of aliphatic carboxylic acid chelating agents, amino acid chelating agents or salt thereof, ether polycarboxylic acid chelating agents or salt thereof, phosphonic acid chelating agents or salt thereof, a salt of hydroxy carboxylic acid chelating agents, polymer or oligomer electrolyte chelating agents, dimethylglyoxime (DG), ascorbic acid or a salt thereof, and thioglycollic acid or a salt thereof; and

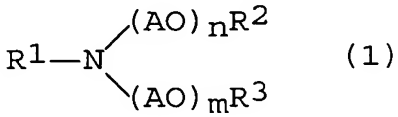
wherein the content of the chelating agent ranges from 0.01 to 30 mol per mol of the nitrogen-containing compound and the weight ratio of the total of the nitrogen-containing compound and the chelating agent to the agricultural chemical ranges from 0.05 to 50.

4. A method for enhancing the penetration of an agricultural chemical into a fungi, bacteria, insect, mite, acarid or plant, said method comprising applying an effective amount of an agricultural chemical composition to a locus which would benefit from said treatment, said agricultural chemical composition comprising:

(a) an agricultural chemical;

(b) at least one nitrogen-containing compound selected from the group consisting of:

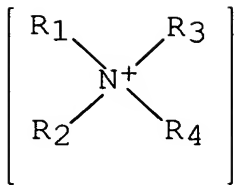
(i) amines represented by formula (1):



(1)

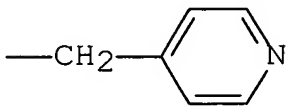
wherein R^1 represents a linear or branched alkyl or alkenyl group having 8 to 22 carbon atoms, each A represents an alkylene group, n and m each represents a number wherein the sum of n and m is 1 to 40, R^2 and R^3 are the same or different from each other and each represents a hydrogen atom or an acyl group;

(ii) quaternary ammonium salts represented by formula (13):



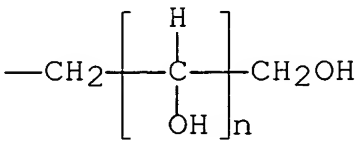
(13)

wherein at least one of R_1, R_2, and R_3 represents a linear or branched alkyl or alkenyl group having 8 to 30 carbon atoms while the other(s) each represents a methyl group, an ethyl group, a benzyl group, a group represented by the formula



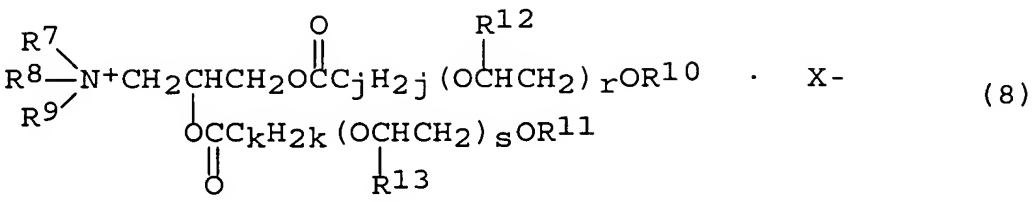
,

a group represented by the formula $-(CH_2CH_2O)_n-H$, wherein n represents an average value and is a number of 1 to 100, or a group represented by the formula



wherein n is a number of 1 to 5, R_4 represents a hydrogen atom, a methyl group, an ethyl group, or a group represented by the formula $-CH_2CH_2OH$, and X^- represents a counter ion;

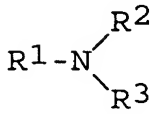
(iii) quaternary ammonium salts represented formula (8):



(8)

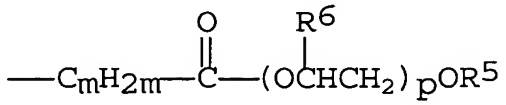
wherein R^7 and R^8 are either the same or different from each other and each represents an alkyl group having 1 to 4 carbon atoms, R^9 represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms, R^{10} and R^{11} are either the same or different from each other and each represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, each R^{12} represents a hydrogen atom or a methyl group, each R^{13} represents a hydrogen atom or a methyl group, j and k are either the same or different from each other and each represents a positive number of 1 to 5, r and s each represents an average value, are either the same or different from each other, and each represents a number of 0 to 30, and X^- represents a counter ion;

(iv) amines represented by formula (3):



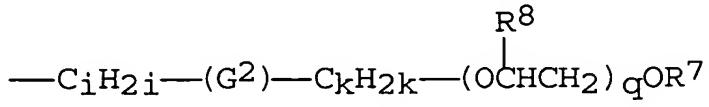
(3)

wherein R^1 represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, R^2 represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_nH_{2n}-(G^1)-R^4$, wherein R^4 represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, G^1 represents -OCO- or -NHCO-, and n represents a positive number of 2 to 6, a group represented by the formula

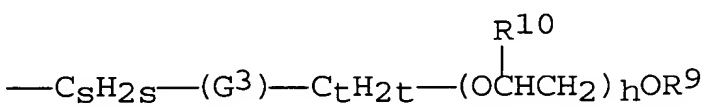


wherein R^5 represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group,

each R^6 represents a hydrogen atom or a methyl group, m is a positive number of 1 to 5, and p represents an average value and is a number of 0 to 30, or a group represented by the formula

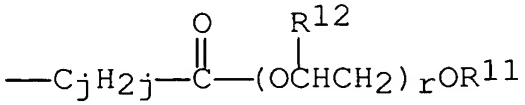


wherein R^7 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^8 represents a hydrogen atom or a methyl group, G^2 represents -OCO- or -NHCO-, i represents a positive number of 2 to 6, k represents a positive number of 1 to 5, and q represents an average value and is a number of 0 to 30, and R^3 represents a group represented by the formula:



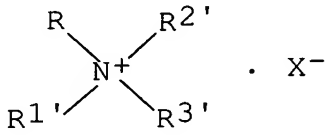
wherein R^9 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{10} represents a hydrogen atom or a methyl group, G^3 represents -OCO- or -NHCO-, s represents a

positive number of 2 to 6, t represents a positive number of 1 to 5, and h represents an average value and is a positive number of 0 to 30, or a group represented by the formula



wherein R^{11} represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{12} represents a hydrogen atom or a methyl group, j represents a positive number of 1 to 5, and r represents an average value and is a positive number of 0 to 30; and

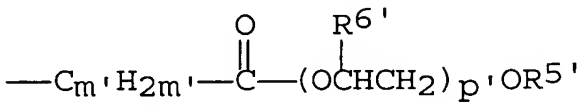
(v) quaternary ammonium salts represented by formula (9):



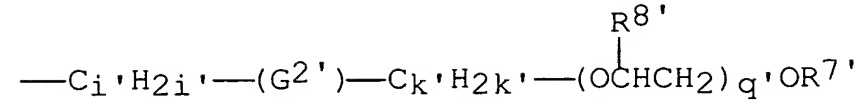
(9)

wherein R represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{1'}$ represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{2'}$ represents

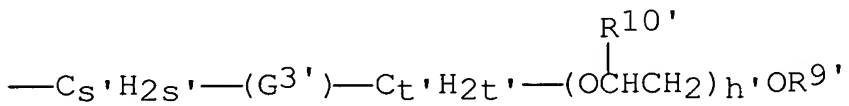
a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_{n'}-H_{2n'}-(G^{1'})-R^{4'}$, wherein $R^{4'}$ represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, $G^{1'}$ is -OCO- or -NHCO-, and n' is a positive number of 2 to 6, a group represented by the formula



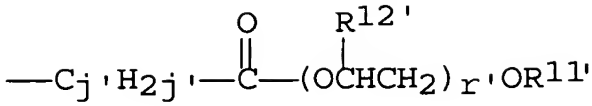
wherein $R^{5'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{6'}$ represents a hydrogen atom or a methyl group, m' is a positive number of 1 to 5, and p' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{7'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{8'}$ represents a hydrogen atom or a methyl group, $G^{2'}$ is -OCO- or -NHCO-, i' is a positive number of 2 to 6, k' is a positive number of 1 to 5, and q' represents an average value and is a number of 0 to 30, $R^{3'}$ represents a group represented by the formula:



wherein $R^{9'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{10'}$ represents a hydrogen atom or a methyl group, $G^{3'}$ is -OCO- or -NHCO-, s' is a positive number of 2 to 6, t' is a positive number of 1 to 5, and h' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{11'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{12'}$ represents a hydrogen atom or a methyl group, j' is a positive number of 1 to 5, and r' represents an average value and is a number of 0 to 30, and X^- is a counter ion;

(c) a chelating agent selected from the group consisting of amino polycarboxylic acid chelating agents or salt thereof, aromatic carboxylic acid chelating agents or salt thereof, a salt of aliphatic carboxylic acid chelating agents, amino acid chelating agents or salt thereof, ether polycarboxylic acid chelating agents or salt thereof, phosphonic acid chelating agents or salt thereof, a salt of hydroxy carboxylic acid chelating agents, polymer or oligomer electrolyte chelating agents, dimethylglyoxime (DG), ascorbic acid or a salt thereof, and thioglycollic acid or a salt thereof; and

(d) an adjuvant;

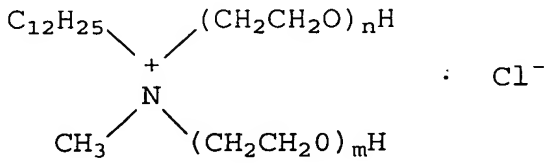
wherein the content of the chelating agent ranges from 0.01 to 30 mol per mol of the nitrogen-containing compound and the weight ratio of the total of the nitrogen-containing compound and the chelating agent to the agricultural chemical ranges from 0.05 to 50.

5. The method of claim 3, wherein said agricultural chemical is a herbicide.

6. The method of claim 3, wherein said nitrogen-containing compound is the amine of formula (1).

7. The method of claim 3, wherein said nitrogen-containing compound is the quaternary ammonium salt of formula (13).

8. The method of claim 7, wherein said nitrogen-containing compound is



wherein n + m = 15.

9. The method of claim 3, wherein said counter ion is a halide, acetate, methyl sulfate, ethylsulfate, a phosphate group, a phosphonate group, a sulfonate group having a hydrocarbon moiety with at least 7 carbon atoms, a sulfate group having a hydrocarbon moiety with at least 7 carbon atoms, an anionic oligomer or copolymer having a degree of polymerization of at least 3 and having an anionic residue, or

an anionic oligomer or polymer having an average molecular weight of 300 to 20,000 and having an acidic anionic residue.

10. The method of claim 3, wherein said agricultural chemical composition further comprises a surfactant other than said nitrogen-containing compound.

11. The method of claim 10, wherein the weight ratio of the nitrogen-containing compound to the surfactant other than said nitrogen-containing compound is from 1/10 to 50/1.

12. The method of claim 3, wherein said agricultural chemical composition further comprises adjuvant for penetration of said agricultural chemical.

13. The method of claim 12, wherein the weight ratio of the nitrogen-containing compound to the adjuvant is from 1/5 to 5/1.

14. A method for enhancing the effectiveness of an agricultural chemical, wherein said method comprises:

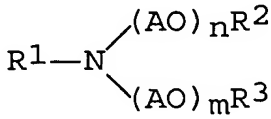
adding a nitrogen-containing compound with a chelating agent to said agricultural chemical to form an agricultural chemical composition,

wherein said agricultural chemical composition comprises:

(a) the agricultural chemical;

(b) the nitrogen-containing compound, said nitrogen-containing compound is selected from the group consisting of:

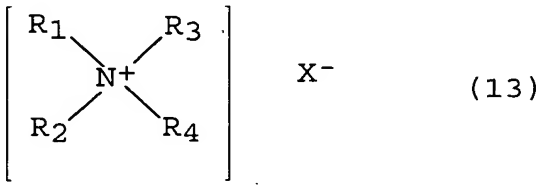
(i) amines represented by formula (1):



(1)

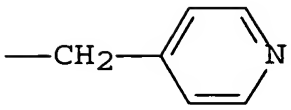
wherein R^1 represents a linear or branched alkyl or alkenyl group having 8 to 22 carbon atoms, each A represents an alkylene group, n and m each represents a number wherein the sum of n and m is 1 to 40, R^2 and R^3 are the same or different from each other and each represents a hydrogen atom or an acyl group;

(ii) quaternary ammonium salts represented by formula (13):

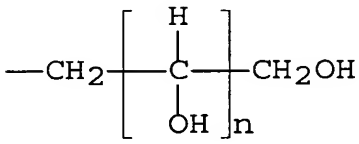


(13)

wherein at least one of R_1, R_2, and R_3 represents a linear or branched alkyl or alkenyl group having 8 to 30 carbon atoms while the other(s) each represents a methyl group, an ethyl group, a benzyl group, a group represented by the formula

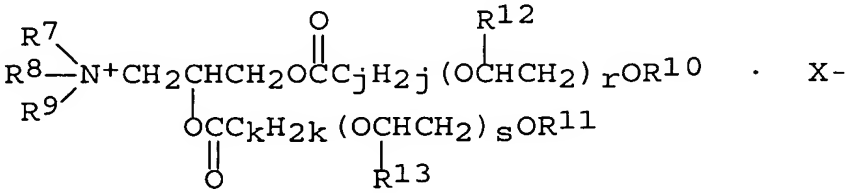


a group represented by the formula $-(CH_2CH_2O)_n-H$, wherein n represents an average value and is a number of 1 to 100, or a group represented by the formula



wherein n is a number of 1 to 5, R_4 represents a hydrogen atom, a methyl group, an ethyl group, or a group represented by the formula $-CH_2CH_2OH$, and X^- represents a counter ion;

(iii) quaternary ammonium salts represented formula (8):

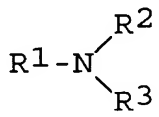


(8)

wherein R^7 and R^8 are either the same or different from each other and each represents an alkyl group having 1 to 4 carbon atoms, R^9

represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms, R^{10} and R^{11} are either the same or different from each other and each represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, each R^{12} represents a hydrogen atom or a methyl group, each R^{13} represents a hydrogen atom or a methyl group, j and k are either the same or different from each other and each represents a positive number of 1 to 5, r and s each represents an average value, are either the same or different from each other, and each represents a number of 0 to 30, and X^- represents a counter ion;

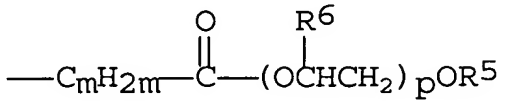
(iv) amines represented by formula (3):



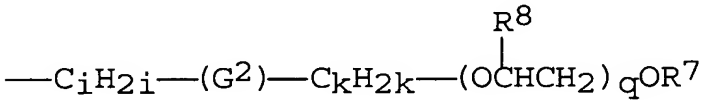
(3)

wherein R^1 represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, R^2 represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group

having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_nH_{2n}-(G^1)-R^4$, wherein R^4 represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, G^1 represents -OCO- or -NHCO-, and n represents a positive number of 2 to 6, a group represented by the formula

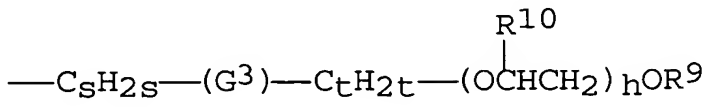


wherein R^5 represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, each R^6 represents a hydrogen atom or a methyl group, m is a positive number of 1 to 5, and p represents an average value and is a number of 0 to 30, or a group represented by the formula

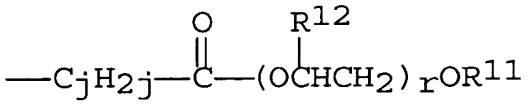


wherein R^7 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^8

represents a hydrogen atom or a methyl group, G^2 represents -OCO- or -NHCO-, i represents a positive number of 2 to 6, k represents a positive number of 1 to 5, and q represents an average value and is a number of 0 to 30, and R^3 represents a group represented by the formula:



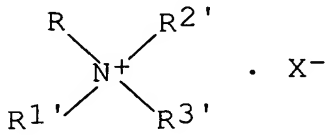
wherein R^9 represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{10} represents a hydrogen atom or a methyl group, G^3 represents -OCO- or -NHCO-, s represents a positive number of 2 to 6, t represents a positive number of 1 to 5, and h represents an average value and is a positive number of 0 to 30, or a group represented by the formula



wherein R^{11} represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, R^{12} represents a hydrogen atom or a

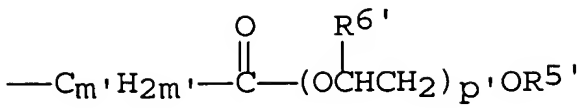
methyl group, j represents a positive number of 1 to 5, and r represents an average value and is a positive number of 0 to 30; and

(v) quaternary ammonium salts represented by formula (9):

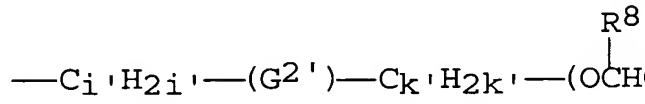


(9)

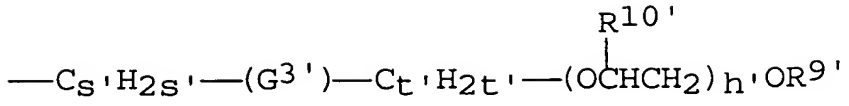
wherein R represents a hydrogen atom, a benzyl group or an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{1'}$ represents an alkyl group having 1 to 4 carbon atoms optionally substituted by a hydroxyl group, $R^{2'}$ represents a linear or branched alkyl group having 1 to 36 carbon atoms optionally substituted by a hydroxyl group or a linear or branched alkenyl group having 2 to 36 carbon atoms optionally substituted by a hydroxyl group, a group represented by the formula: $-C_{n'}-H_{2n'}-(G^{1'})-R^{4'}$, wherein $R^{4'}$ represents a linear or branched alkyl or alkenyl group having 5 to 36 carbon atoms optionally substituted by a hydroxyl group, $G^{1'}$ is -OCO- or -NHCO-, and n' is a positive number of 2 to 6, a group represented by the formula



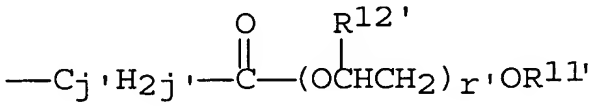
wherein $R^{5'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{6'}$ represents a hydrogen atom or a methyl group, m' is a positive number of 1 to 5, and p' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{7'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{8'}$ represents a hydrogen atom or a methyl group, $G^{2'}$ is -OCO- or -NHCO-, i' is a positive number of 2 to 6, k'' is a positive number of 1 to 5, and q' represents an average value and is a number of 0 to 30, $R^{3'}$ represents a group represented by the formula:



wherein $R^{9'}$ represents a linear or branched alkyl or alkenyl group having 4 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{10'}$ represents a hydrogen atom or a methyl group, $G^{3'}$ is -OCO- or -NHCO-, s' is a positive number of 2 to 6, t' is a positive number of 1 to 5, and h' represents an average value and is a number of 0 to 30, or a group represented by the formula:



wherein $R^{11'}$ represents a linear or branched alkyl or alkenyl group having 6 to 36 carbon atoms optionally substituted by a hydroxyl group, $R^{12'}$ represents a hydrogen atom or a methyl group, j' is a positive number of 1 to 5, and r' represents an average value and is a number of 0 to 30, and X^- is a counter ion; and

(c) the chelating agent, said chelating agent is selected from the group consisting of amino polycarboxylic acid chelating agents or salt thereof, aromatic carboxylic acid chelating

agents or salt thereof, a salt of aliphatic carboxylic acid chelating agents, amino acid chelating agents or salt thereof, ether polycarboxylic acid chelating agents or salt thereof, phosphonic acid chelating agents or salt thereof, a salt of hydroxy carboxylic acid chelating agents, polymer or oligomer electrolyte chelating agents, dimethylglyoxime (DG), ascorbic acid or a salt thereof, and thioglycollic acid or a salt thereof; and

wherein the content of the chelating agent ranges from 0.01 to 30 mol per mol of the nitrogen-containing compound and the weight ratio of the total of the nitrogen-containing compound and the chelating agent to the agricultural chemical ranges from 0.05 to 50.